

REMARKS

The forgoing amendment amends claims 1, 5, 12, 11 and 13 and cancels claim 10. Upon entry of the amendment claims 1-9 and 11-13 are pending in the application. For the reasons set forth below, Applicants believe that the rejections should be withdrawn and that the claims are in condition for allowance.

REJECTION OF CLAIM 1 UNDER 35 U.S.C. 103(a)

The Examiner rejected Claim 1 under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No. 2003/0060162 to Shinagawa *et al.* (“Shinagawa”) in view of U.S. Patent No. 6,064,905 to Webster, Jr. *et al.* (“Webster”) in view of U.S. Publication No. 2003/0151600 to Takeuchi *et al.* (“Takeuchi”), and further in view of U.S. Publication No. 2004/0066605 to Trinh (“Trinh”).

As discussed in the specification, the transmitting and receiving electrode of a conventional transceiver is provided only on the bottom of an external wall surface of the insulating case. When a human hand (electric field transmission medium) holds the transceiver the hand closely approaches not only the bottom but also the side of the external wall surface of the insulating case and the hand is electrically coupled to a ground electrode located at the side of the transceiver. If an electric field for transmission is induced in the hand from the transmitting and receiving electrode, a part of the electric field returns from the hand to the transceiver via the side. This prevents the transceiver from carrying out normal transmission operations because the pattern of the electric field for transmission is disturbed. *See* [0038] and FIG. 9.

The specification describes several embodiments that overcome this problem. *See e.g.* FIGS. 27 and 30-35 and the accompanying text. The transceiver 3a (or in other embodiments one of 3b-3f) includes a transceiver main body 3a, an insulating case 33 and a transmitting and receiving electrode 105 (or in some embodiments 105a), a first ground electrode 131, a second ground electrode 161, and a third ground electrode 163. The insulating case 33 accommodates the transceiver main body 30. The transmitting and receiving electrode 105 (or 105a) is continuously attached to a bottom and a side of an

external wall surface of the insulating case 33. At least one of the first ground electrode 131, the second ground electrode 161 and the third ground electrode 163 is attached to an internal wall surface of the insulating case 33.

If a human hand 100 holds the transceiver 3a (or any one of 3b-3f) so that the hand closely approaches the bottom and the side of the external wall surface of the insulating case 33, the hand 100 is not electrically coupled to the first ground electrode 131, the second ground electrode 161 or the third ground electrode 163 because the transmitting and receiving electrode 105 (or 105a) covers not only the bottom but also the side of the external wall surface of the insulating case 33. Even if transmission electric fields E1, E2, and E3 are induced in the hand 100 from the transmitting and receiving electrode 105 (or 105a), no part of the transmission electric fields E1, E2, E3 is returned to the transceiver 3a (or one of 3b-3f). Since the pattern of the transmission electric fields E1, E2, and E3 is not disturbed, the transceiver 3a (or one of 3b-3f) can carry out normal transmission operations. *See e.g.* [0229], [0231-0232], [0246-0250].

Claim 1 requires that the transmitting and receiving electrode is continuously provided on the bottom and the side of the external wall surface of the insulating case, so that the transmitting and receiving electrode is adapted to allow the electric field transmission medium to closely approach the bottom and the side. The amendment to claim 1 clarifies that that transceiver includes a ground electrode and that the transmitting and receiving electrode prevents the electric field transmission medium from being electrically coupled to the ground electrode.

The Examiner admitted that Shinagawa fails to disclose that the “transmitting and receiving electrode is continuously provided on a bottom and a side of the external wall surface of said insulating case, so that said transmitting and receiving electrode is adapted to allow said electric field transmission medium to closely approach the bottom an the side,” as recited by claim 1. Shinagawa also fails to disclose or suggest that the transmitting and receiving electrode 105 prevents the hand from being electrically coupled to the ground electrode 131.

In rejecting claim 1, the Examiner cited Webster and alleged that Webster describes

“electrodes provided on a side and a bottom of [an] external wall surface.” Webster describes catheters for mapping the direction and velocity of electrical activity in the heart. A multi-element tip electrode 35 is provided on the distal end of the catheter. The multi-element tip electrode 35 includes a non-conductive matrix 37 having a plurality of holes 54. Electrode members 52 are mounted within the non-conductive matrix 37. Each electrode member 52 is cylindrically shaped, having a generally round cross sectional area. The electrode members 52 are discretely arranged about the non-conductive matrix 37, such that when the distal end of the catheter comes in contact with the myocardium, at least two electrode members 52 make contact with the tissue. *See* FIGs. 3A-3B. In addition, in the first modified example, a non-conductive base 38 may be mounted on the distal end of the catheter. *See* FIG. 3C. The non-conductive base 38 includes a plurality of holes 60. The non-conductive matrix 37 overlaps the non-conductive base 38. *See* Column 6, lines 17-53.

In the second modified example, the multi-element tip electrode 35 is in the form of a split-tip electrode and includes a plurality of electrode members 88. *See* FIGs. 6-8. Each electrode member 88 has two interior sides 90 and an exterior surface 92. One interior side 90 of each electrode member 88 is opposed to one interior side 90 of an adjacent electrode member 88 via an insulating material 94. The electrode members 88 are electrically isolated from one another by the insulating material 94. The exterior surface 92 of each electrode member 88 is exposed such that when the distal end of the catheter comes in contact with the myocardium, the electrode members 88 make contact with the tissue. *See* Column 8, lines 60-66 and Column 9, lines 9-53.

Webster fails to disclose or suggest that the electrode members 52 (or 88) are continuously provided on a bottom and a side of an external wall surface of the catheter, so that the electrode members 52 (or 88) are adapted to allow the tissue to closely approach the bottom and the side, as recited in independent claim 1. Webster’s electrode members must be discretely provided on the bottom and the side of the external wall surface of the catheter because the catheter needs to detect a local position where an electric signal is received in order to precisely map the direction and velocity of the electrical activity in the heart. *See* Column 7, line 38-Column 8, line 9. If the catheter of Webster is modified so that an

electrode member is continuously provided on the bottom and the side, then the catheter cannot detect a local position where an electric signal is received because the area where the electrode member receives an electric signal widens.

As argued in the previous response, there is no reason to combine Shinagawa and Webster. Even if the transceiver of Shinagawa and the catheter of Webster are combined, the combination would not overcome the problem of disturbing the pattern of the electric field for transmission. The combination would allow a part of the electric field for transmission to return from the human hand to the transceiver via the non-conductive matrix or the insulating material, which would allow the human hand to be electrically coupled to the ground electrode arranged between the electrode members, which in turn would disturb a pattern of the electric field for transmission.

The other references (Takeuchi and Trinh) cited by the Examiner do not address the problem or describe a configuration that would prevent disturbing the pattern of the electric field for transmission by providing a transmitting and receiving electrode that prevents the electric field transmission medium from being electrically coupled to a ground electrode, as required by claim 1.

In the *Response to Arguments*, the Examiner alleged that claim 1 does not require that “all of the electric field should return from the human hand to the transceiver via the insulating [material]” and in the rejection of claim 1 the Examiner alleged that the transmitting and receiving electrode being continuously provided on the bottom of the external wall surface does not provide an advantage, is not used for a particular purpose or does not solve a problem. The amendment to claim 1 clarifies that that transceiver includes a ground electrode and that the transmitting and receiving electrode, which is continuously provided on the bottom and the side of the external wall surface of the insulating case, prevents the electric field transmission medium from being electrically coupled to the ground electrode.

REJECTION OF CLAIMS 5, 12 AND 13 UNDER 35 U.S.C. 103(a)

The Examiner rejected claims 5, 12 and 13 under 35 U.S.C. 103(a) as being

unpatentable over Shinagawa in view of Webster relying upon the same type of arguments made in rejecting claim 1. Independent claims 5, 12 and 13 have been amended to include a ground electrode attached to an internal wall surface of the insulating case and to clarify that the transmitting electrode (claims 5 and 12) or the receiving electrode (claim 13) prevents the electric field transmission medium from being electrically coupled to the ground electrode. Independent claims 5, 12 and 13 are patentable for similar reasons as given above in connection with claim 1.

DEPENDENT CLAIMS

Claims 2-4 depend from claim 1 and claims 6-9 and 11 depend from claim 5. The dependent claims are patentable over the cited references for at least the reasons given above for the independent claims from which they depend and may be patentable for additional reasons.

CONCLUSION

The foregoing is submitted as a complete response to the Office Action identified above. This application should now be in condition for allowance, and Applicants solicit a notice to that effect. If there are any issues that can be addressed via telephone, the Examiner is asked to contact the undersigned at (404) 685-6799. The Commissioner is authorized to charge any additional fees that may be due or credit any overpayment to Deposit Account No. 11-0855.

Respectfully submitted,

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